

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference k	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/US04/01640	International filing date (day/month/year) 21 January 2004 (21.01.2004)	Priority date (day/month/year) 21 January 2003 (21.01.2003)	
International Patent Classification (IPC) or national classification and IPC IPC(7): G06K 9/36, 9/38 and US Cl.: 382/250,251			
Applicant SHARP LABORATORIES OF AMERICAS, INC.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☐ (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:

☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 29 October 2004 (29.10.2004)	Date of completion of this report 22 December 2004 (22.12.2004)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Authorized officer Virginia Kibler Telephone No. (703) 306-4072

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/US04/01640

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ the international application as originally filed/furnished
- ☒ the description:
 - pages 1-11 as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
- ☒ the claims:
 - pages 12-16 as originally filed/furnished
 - pages* _____ as amended (together with any statement) under Article 19
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
- ☒ the drawings:
 - pages 3 as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Form PCT/IPEA/409 (Box No. I) (January 2004)

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/US04/01640

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 3-7, 9, 11

YES

Claims 1, 2, 8, 10, 12-25

NO

Inventive Step (IS)

Claims NONE

YES

Claims 1-25

NO

Industrial Applicability (IA)

Claims 1-25

YES

Claims NONE

NO

2. Citations and Explanations (Rule 70.7) Please See Continuation Sheet

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

Claims 1, 2, 8, 10, and 12-25 lack novelty under PCT Article 33(2) as being anticipated by Watson (US 5,426,512).

Regarding claim 1, Watson discloses providing a first image 30, quantizing a discrete cosine transform of the first image using a first set of quantization values (Col. 3, lines 54-68, Col. 4, lines 1-10), quantizing the discrete cosine transform of the first image using a second set of quantization values (Col. 4, lines 7-10); comparing the first image to a spatial reconstructed image based upon the first set of quantization values using a model (Col. 4, lines 1-7; Col. 8, lines 50-59), comparing the first image to a spatial reconstructed image based upon a second set of quantization values using a model (Col. 9, lines 30-52), selecting one of the first set of quantization values and the second set of quantization values based upon respective comparing (Figure 3; Col. 4, lines 7-10).

Regarding claims 2, 8, and 10, Watson discloses the DCT results in a matrix of values (Col. 6, lines 31-44) and the comparing is based upon at least in part a contrast sensitivity function of the human visual system and a contrast sensitivity difference model (Col. 2, lines 15-68; Col. 7, lines 8-68).

Regarding claims 12 and 13, Watson discloses the first set of quantization values is based upon at least in part viewing conditions and image-structure dependent (Col. 7, lines 8-63) and a luminance response of a display (Col. 7, lines 64-68, Col. 8, lines 1-32).

Regarding claims 14-16, Watson discloses determining a first and a second error measure based upon comparing of a first set and a second set, respectively (Col. 4, lines 7-10; Col. 9, lines 21-52; Figure 3). Watson discloses selecting based upon the first and second error measures (Figure 3).

Regarding claims 17-19, Watson discloses modifying the selected set of quantization values based upon the error measure (Col. 9, lines 30-52). Watson discloses modifying the image based upon the modified selected set of quantization values (Col. 9, lines 30-52) and encoding the modified image (Col. 6, lines 45-60).

Regarding claim 20, Watson discloses providing a first image 30, quantizing a discrete cosine transform of the first image using a first set of quantization values (Col. 3, lines 54-68, Col. 4, lines 1-10), comparing the first image to a spatial reconstructed image based upon the first set of quantization values using a model to determine an error measure (Col. 4, lines 1-7; Col. 8, lines 50-59); based upon the error measure modifying the first set of quantization values (Col. 9, lines 30-52) and quantizing the DCT of the first image using the modified first set of quantization values (Figure 3).

Supplemental Box

Regarding claims 21 and 22, Watson discloses a scaling factor is selectively increased and decreased based upon the error measure (Col. 9, lines 30-52).

Regarding claims 23 and 24, Watson discloses the error measures is selectively increased or decreased provided error measure is less than a threshold or greater than a threshold, respectively (Col. 9, lines 30-52).

Regarding claim 25, Watson discloses providing a first image 30, quantizing a discrete cosine transform of the first image using a first set of quantization values (Col. 3, lines 54-68, Col. 4, lines 1-10), quantizing the discrete cosine transform of the first image using a second set of quantization values (Col. 4, lines 7-10); comparing the first image to a spatial reconstructed image based upon the first set of quantization values using a model to determine an error measure (Col. 4, lines 1-7; Col. 8, lines 50-59); comparing the first image to a spatial reconstructed image based upon the second set of quantization values using a model to determine an error measure (Col. 4, lines 1-7; Col. 8, lines 50-59; Col. 9, lines 30-52); selecting one of the first set of quantization values and the second set of quantization values based upon respectively error measures (Figure 3; Col. 4, lines 7-10); based upon the error measure modifying a respective set of quantization values (Col. 9, lines 30-52) and quantizing the DCT of the first image using the modified set of quantization values (Figure 3).

Claim 11 lacks an inventive step under PCT Article 33(3) as being obvious over Watson (US 5,426,512).

Regarding claim 11, Watson discloses providing a contrast sensitivity difference model (Col. 2, lines 15-68; Col. 7, lines 8-68), but does not expressly recognize that the model collapses to CIELAB for large patches of color. However, it is well known to provide a model that collapses to CIELAB for large patches of color. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to specify collapsing to CIELAB for large patches because it is well known and the standard CIELAB is suitable for use on large uniform color targets.

Claims 3-7 and 9 lack an inventive step under PCT Article 33(3) as being obvious over Watson (US 5,426,512) in view of Jones et al. (US 6,349,151).

Regarding claims 3-7 and 9, Watson discloses the first set of quantization values is based upon at least is part display and perceptual parameters (Col. 7, lines 7-68, Col. 8, lines 1-33), but does not appear to expressly state color primaries, modulation transfer function, tone, resolution, particular viewing distance, or color gamut. However, Jones et al. discloses generating a plurality of quantization parameter sets for compressing a digital image including providing characteristics of the intended display medium (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art to have modified the display and perceptual parameters to include specific characteristics of the intended display medium because by including characteristics of the intended display medium it results in an improved image quality.